Grade 7 CRT Item Specifications

"Enduring and Important Knowledge" identified in previous grade-levels may be included within the context of some problems.

Prioritized Standards		Knowledge/Skills Assessed	Item Specifications
1.7.1 Read, write, and compare ratios and proportions; read, write, add, subtract, multiply, and divide positive and negative numbers. (C) **1.7.2** Apply positive and negative numbers, ratios, and proportions to solve mathematical and practical problems. (P, PS) **1.7.3** Use absolute value and the properties of real numbers including distributive, commutative, and associative to solve problems. (C, P) **1.7.6** Compare and order groups containing a mix of fractions, percents, and decimals (e.g., on a number line). (C, P) **1.7.7** Select and round to the appropriate significant digits; estimate using a variety of methods. (P, PS) **1.7.9** Translate among fractions, decimals and percents. (P, PS)	**Concepts**	**1.7.1** Read, write, and compare ratios and proportions; read and write positive and negative numbers **1.7.3** Identify the absolute values of real numbers; identify the properties of real numbers. **1.7.6** Compare groups containing a mix of fractions, percents, and decimals.	**1.7.1** Item limited to integers and/or reading and writing positive and negative numbers. **1.7.3** Items that involve properties of real number should include distributive, identity, commutative, and associative. Items may not include variables. **1.7.6** Items can use such models as (e.g., on a number line) to compare a mix of fractions, percents and decimals.
	Procedures	**1.7.2** Apply positive and negative numbers, ratios, and proportions to solve problems. **1.7.3** Use the properties of real numbers to complete equations. **1.7.6** Order groups containing a mix of fractions, percents, and decimals. **1.7.7** Round solutions to the appropriate significant digits. **1.7.9** Translate among fractions, decimals and percents.	**1.7.2** Item are non contextual. **1.7.3** Items that involve properties of real number should include distributive, identity, commutative, and associative. [e.g., Which expression is equivalent to $6(2 + 3)$?] **1.7.6** Items can use such models as (e.g., on a number line) to order a mix of fractions, percents and decimals. **1.7.9** Repeating decimals limited to 1/3 and 2/3 only.
	Problem Solving	**1.7.2** Apply positive and negative numbers, ratios, and proportions to solve mathematical and practical problems. **1.7.7** Use estimation, and rounding to the appropriate significant digits in problem solving. **1.7.9** Translate among fractions, decimals and percents in real-world problem solving situations	**1.7.2** Items are contextual. **1.7.9** Repeating decimals limited to 1/3 and 2/3 only.

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Prioritized Standards		Knowledge/Skills Assessed	Item Specifications
2.7.1 Use and create coordinate graphs (i.e., linear, geometric, and exponential) to represent and/or interpret patterns and relationships, with and without calculators. (C, P) **2.7.2** Identify, model, describe, and evaluate relationships using graphs, with and without technology. (PS) **2.7.3** Evaluate formulas and algebraic expressions for given values of a variable (e.g., A = lw: given l = 6, w = 2, then A = 12). (P) **2.7.4** Represent mathematical situations using algebraic language and symbols. (C) **2.7.6** Model, identify, and solve linear equations and inequalities using concrete and informal methods; relate this process to the order of operations. (C, P) **2.7.7** Generate and graph a set of ordered pairs to solve a linear equation. (P, PS)	**Concepts**	**2.7.1** Identify points on a coordinate graph. **2.7.4** Identify written numerical and algebraic expressions from given mathematical situations. **2.7.6** Identify a model of a linear equation and/or inequality.	**2.7.1** Name the coordinates of points on a graph in all four quadrants. **2.7.4** Limit to no more than two operations and/or two variables. **2.7.6** Limit to one variable in inequality equations.
	Procedures	**2.7.1** Use and create coordinate graphs (i.e., linear, geometric, and exponential) to represent and/or interpret pattern **2.7.3** Evaluate formulas and algebraic expressions for given values of a variable. **2.7.6** Solve linear equations and inequalities using concrete and informal methods. **2.7.7** Generate and graph a set of ordered pairs to solve a linear equation.	**2.7.1** Items may require students to identify a graph based on a pattern shown in a table. **2.7.3** Formulas should not cue any formulas used in measurement and geometry sections. **2.7.6** Limit to one variable in inequality equations. Relate the process to the order of operations to solve the problem. **2.7.7** Given an equation and a set of ordered pairs, recognize the graph of the equation. Given an equation and a graph, recognize the set of ordered pairs. Only use whole numbers.
	Problem Solving	**2.7.2** Identify, model, describe, and evaluate relationships using graphs in real-world problems and situations. **2.7.7** Generate and graph a set of ordered pairs to solve a linear equation from a contextual real-world problem.	**2.7.2** Models may include tables, charts and graphs. **2.7.7** Must be a contextual real-world problem. Given an equation and a set of ordered pairs, recognize the graph of the equation. Given an equation and a graph, recognize the set of ordered pairs.

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Prioritized Standards		Knowledge/Skills Assessed	Item Specifications
3.7.1 Estimate and convert units of measure for mass, and volume within the same measurement system; compare corresponding units of the two systems. (C, P, PS) **3.7.3** Estimate, measure to the required degree of accuracy, derive, and apply standard formulas to find the volume and surface area of solid figures (e.g., cylinders, triangular solids). (C, P, PS) **3.7.5** Write, solve and apply proportions. (C, P, PS) **3.7.6** Use elapsed time to solve practical problems (e.g., develop schedules, plan trips). (P, PS)	**Concepts**	**3.7.1** Compare corresponding units of length of the two systems. **3.7.3** Identify the correct formula needed to calculate the volume and surface area of solid figures. **3.7.5** Write proportions.	**3.7.3** Items may include solid figures such as cylinders and triangular solids.
	Procedures	**3.7.1** Estimate and convert units of measure for mass, and volume within the same measurement system. **3.7.3** Estimate, measure to the required degree of accuracy, and apply standard formulas to find the volume and surface area of solid figures **3.7.5** Solve problems involving simple proportional equations. **3.7.6** Determine elapsed time in problems.	**3.7.1** Use numbers that students can work without a calculator. Focus should be on the estimation and conversion rather than the calculation. **3.7.3** Item can ask student to measure designated lengths (1/8 inch and millimeters) to the required accuracy. Item may also ask to use formulas to find volume and surface area of solid figures. **3.7.6** Items may ask for start time, end time or elapsed time.
	Problem Solving	**3.7.1** Use unit conversion and estimation to solve real-world problems involving the measure for mass and volume within the same measurement system. **3.7.3** Apply standard formulas to find the volume and surface area of solid figures in a real-world problem situation. **3.7.5** Apply and use proportions to solve contextual real-world problems. **3.7.6** Solve contextual real-world problems involving elapsed time.	**3.7.1** Use numbers that students can work without a calculator. Focus should be on the estimation and conversion rather than the calculation. **3.7.3** Items may include solid figures such as cylinders and triangular solids.

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Prioritized Standards		Knowledge/Skills Assessed	Item Specifications
4.7.1 Identify, describe by properties, classify, compare, and draw regular and irregular polygons; find the sum of the interior angles. (C, P, PS) **4.7.3** Use coordinate geometry and models to demonstrate geometric transformations including rotate/turn, translate/slide, and reflect/flip by finding the ordered pairs that describe the location of the original and the transformed figures. (C, P, PS) **4.7.5** Use coordinate geometry to represent slope, midpoint, and horizontal and vertical distance. (P) **4.7.6** Describe the properties of geometric relationships including parallel lines, perpendicular lines, bisectors, triangles, and quadrilaterals. (C, P, PS) **4.7.7** Model the Pythagorean Theorem; solve for the hypotenuse using the theorem. (C, P, PS)	Concepts	**4.7.1** Identify, classify, and compare regular and irregular polygons; describe by properties and recognize regular and irregular polygons. **4.7.3** Identify and name geometric transformations represented by models and graphs. **4.7.6** Identify the properties of geometric relationships **4.7.7** Identify models of the Pythagorean Theorem.	**4.7.3** Items should ask students to identify transformational motion. Items may include transformational motions such as rotate/turn, translate/slide, reflect/flip. **4.7.6** Items can include geometric relationships such as parallel lines, perpendicular lines, bisectors, triangles, and quadrilaterals. **4.7.7** Limited to Pythagorean triples only.
	Procedures	**4.7.1** Find the sum of the interior angles. **4.7.3** Use coordinate geometry and models to demonstrate geometric transformations including rotate/turn, translate/slide, and reflect/flip by finding the ordered pairs that describe the location of the original and the transformed figures. **4.7.5** Use coordinate geometry to represent slope, midpoint, and horizontal and vertical distance. **4.7.6** Use the properties of geometric relationships to solve problems. **4.7.7** Determine the solution for the hypotenuse using the Pythagorean Theorem.	**4.7.1** Polygons limited to three to eight-sided figures. **4.7.3** Items may ask students to identify figure showing transformational motion. Items may also ask students to identify ordered pairs that describe the location of the original and/or transformed figure. Items may include transformational motions such as rotate/turn, translate/slide, reflect/flip. **4.7.5** Coordinates need to be integers only. **4.7.6** Items can include geometric relationships such as parallel lines, perpendicular lines, bisectors, triangles, and quadrilaterals. **4.7.7** Limited to Pythagorean triples only.
	Problem Solving	**4.7.1** Determine the sum of the interior angles from contextual real-world problems. **4.7.3** Use coordinate pairs to indicate or record positional change resulting from transformational motion in a coordinate plane. **4.7.6** Use the properties of geometric relationships including parallel lines, perpendicular lines, bisectors, triangles, and quadrilaterals in contextual real-world problems. **4.7.7** Determine the solution for the hypotenuse using the Pythagorean Theorem in contextual real-world problems.	**4.7.1** Polygons limited to three to ten-sided figures. **4.7.3** Item is intended to be used at this level for the **constructed response** type only. Items may include transformational motions such as rotate/turn, translate/slide, reflect/flip. **4.7.7** Limited to Pythagorean triples only.

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Prioritized Standards		Knowledge/Skills Assessed	Item Specifications
5.7.1 Organize, display, read, and analyze data, with and without technology, using a variety of displays including frequency distributions and circle graphs. (C, P, PS) **5.7.4** Select, use, and graph (when possible) measures of variability including range, distribution and possible outliers. (C, P, PS) **5.7.6** Given a set of data, interpolate and extrapolate to make and explain predictions. (PS)	Concepts	**5.7.1** Read data using a variety of displays. **5.7.4** Identify measures of variability including range, distribution and possible outliers.	**5.7.1** Data displays may include frequency distributions and circle graphs. Items may ask questions on display data only.
	Procedures	**5.7.1** Organize and display data using a variety of displays to solve problems. **5.7.4** Use, and graph (when possible) measures of variability.	**5.7.1** Data displays may include frequency distributions and circle graphs. Items should ask students to recognize the correct display. Organization of information may demand computation from the various displays. **5.7.4** Measures of variability may include range, distribution and possible outliers.
	Problem Solving	**5.7.1**. Organize, display and analyze data using a variety of displays to solve contextual real-world problems. **5.7.4** Use, and graph (when possible) measures of variability to solve contextual real-world problems. **5.7.6** Given a set of data, interpolate and extrapolate to make and explain predictions.	**5.7.1** Data displays may include frequency distributions and circle graphs. Organize and display used in **constructed response** only. **5.7.4** Measures of variability may include distribution and possible outliers. Graph in **constructed response** only.